

REMARKS

Applicant appreciates the Examiner's thorough consideration provided the present application. Claims 1-2, 4-9 and 11-16, 18-20 and 22-25 are currently pending in the instant application. Claims 1, 6-8, 12-16, and 18-20 have been amended. Claims 1 and 16 are independent. Claims 10, 17, and 21 have been cancelled. Claims 22-25 have been added for the Examiner's consideration. Reconsideration of the present application is earnestly solicited.

Applicant wishes to thank the Examiner, Mr. Tuan Ho, for the courtesies of the interview granted on April 26, 2001. During the course of this interview, the foregoing amendments were either presented or discussed by Applicant's representative and the aforementioned Examiner. As will be discussed hereinafter, Applicant respectfully submits that all of the claims of the present application are now in a condition for allowance. The Examiner is again thanked for granting the interview and the assistance provided during the interview.

Drawings

Applicant appreciates the Examiner's indication of the removal of the objections to the drawings and approval of the Drawing Change Approval Request.

Specification

Applicant has amended the specification to remove references to the subject matter that Examiner has indicated as being new matter in the claims. Without conceding the propriety of the Examiner's rejections, but merely to timely advance the prosecution of the present application, Applicant has made the changes required by the Examiner in the Office Action.

For example, the Examiner has rejected to the phrase "sudden change in force" as allegedly being new matter. Applicant has removed this terminology from the specification and corresponding claims. However, the specification already incorporates the broader phrase "sudden change in momentum." It is Applicant's position that a sudden change in force could be detected by sensors detecting a sudden change in momentum.

One of ordinary skill in the art would appreciate that "momentum" is inherently related to "force." Momentum is defined as the product of the mass of a body times its velocity. Newton's second law is routinely restated as the sum of the forces acting on a body (ΣF) being equal to the change in momentum (dp) of the body (or system) with respect to time (dt).

See Newton's Second Law: $\Sigma F = dp/dt$, where $p = m * v$.

The changes to the specification were originally made to provide antecedent basis for the original claimed subject matter. Applicant respectfully submits that the foregoing amendments to the specification specifically address

every informality cited by the Examiner and therefore do not provide any new matter.

Claim Rejections Under 35 U.S.C. § 112

Applicant appreciates the Examiner's indication of the removal of the rejections under 35 U.S.C. § 112, second paragraph to claims 1-20 as advanced in the previous Office Action.

I. Claims 1-2, 4-15, 18 and 21 stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With respect to the recitations of "any touch screen, voice activation, and button," "sudden change in force," and the specific references to individual elements of claims 1, 10 and 18, Applicant respectfully submits that these rejections have been obviated and/or rendered moot by the foregoing amendments to the claims.

As stated hereinabove, the Examiner has rejected to the phrase "sudden change in force" as allegedly being new matter. Applicant has removed this terminology from the specification and corresponding claims. However, the specification already incorporates the broader phrase "sudden change in

momentum.” It is Applicant’s position that a sudden change in force could be detected by most sensors detecting a sudden change in momentum.

One of ordinary skill in the art would appreciate that “momentum” is inherently related to “force.” Momentum is defined as the product of the mass of a body times its velocity. Newton’s second law is routinely restated as the sum of the forces acting on a body (ΣF) being equal to the change in momentum (dp) of the body (or system) with respect to time (dt).

See Newton’s Second Law: $\Sigma F = dp/dt$, where $p = m * v$.

II. Claims 1-2 and 4-21 also stand rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The Examiner has specifically cited that “the specification does not describe how the digital sensor 50 senses external events so as to trigger the beginning and termination of capturing process of images and audio.” Applicant respectfully traverses this rejection.

First, Applicant respectfully submits that the Examiner is mischaracterizing the functionality/patentable distinctions of the present invention. One of skill in the art will appreciate that the visual/audio scenes that are continuously captured by the apparatus are buffered using a first-in-

first-out mechanism; and the then buffered visual scenes/sound waves can be preserved for a predetermined period of time before and after an incident as a result of a manual or automatically detected triggering/external event. Without the use of a triggering action (manual or automatic), the scenes/waves will continue to be captured and buffered (older scenes being replaced with newer scenes in repeated cycles, e.g. predetermined time intervals, defined in terms of seconds, hours, days, e.g. only limited by the resulting size of the apparatus and the required memory capacity).

The sensor 50 is simply used to detect an event/action, e.g. a sudden braking action (change in momentum), shock waves/physical impact, a manual triggering action, e.g. human induced triggering (touch button or brake pedal). Applicant respectfully submits that the types of sensor that are actually used to detect a triggering event is not critical, but is instead merely a resulting requirement of the event that is desired to be recorded.

One of ordinary skill in the art will appreciate that there are numerous available sensors from many manufacturers that can accomplish the function of detecting "physical impact, sudden changes in momentum, shock waves, sudden change in sound wave amplitudes, and manual activation." Piezo-electric crystal devices such as accelerometers, electro-magnetic sounders, and deceleration detection sensors are all examples of satisfactory sensors that can accomplish this event detection. Automobile airbag technology utilizes many

sensors that can be used similarly for detecting physical impact and changes in momentum.

Applicant has provided in the form of an Information Disclosure Statement several references that clearly provide examples of sensors that can readily be incorporated into the present invention and would have been recognized by one of ordinary skill in the art with the assistance of Applicant's invention and written description.

The following descriptions are provided as brief statements of the relevance of each reference:

"ADXL150/ADXL250 Single/Dual Axis iMEMS ® Accelerometers" shows an example of an impact sensor using an accelerometer.

"Sound Transducers" shows examples of sound activated microphone sensors.

"ClearTek 3000" shows an example of capacitive touchscreens suitable for manual activation/human induced triggering/push button interface.

"C&K Alternate & Momentary Action Pushbutton Switches" shows examples of a manual activation/human induced triggering/push button interface.

U.S. Patent No. 5,784,525 describes an image capturing device having a push button activation.

U.S. Patent No. 5,387,955 describes a remote wireless interface to a camera with pushbuttons.

U.S. Patent No. 5,214,516 describes a timer switch for recording sound for a predetermined period in an image pickup system.

PCT WO 98/36213 describes multiple sensing means for detecting a vehicle is decelerating.

U.S. Patent No. 5,709,439 describes a manual brake sensing means for detecting a substantial braking force/braking action on brake pedal.

Further, Applicant respectfully submits that the original written description, including the specification, abstract, claims and drawings in their entirety, clearly enable one of ordinary skill in the art to which it pertains the ability to make/and or use the invention (enablement).

For example, Applicant's original description clearly and thoroughly describes at least two (response limited to these two examples for brevity) examples of how the apparatus of the present invention (including the digital sensor 50) senses external events so as to trigger the beginning and termination of a capturing process of images and video.

First, it is clear from the written description that manual triggering can be utilized to trigger the beginning and end of a capturing process of images and audio. As aforementioned, U.S. Patent No. 5,214,516 describes a timer switch for recording sound for a predetermined period in an image pickup system. This would be another manner in which the termination of preserving images could be accomplished.

Second, it is clear from the written description that triggering (i.e., means for triggering) can be further accomplished by detection of a physical event. For example, as clearly described in the original claims, a physical invent can be “a physical impact, sudden change in momentum, shock wave, sudden change in sound wave amplitude, and manual activation.” Applicant respectfully submits that it would be clear to anyone of ordinary skill in the related art that numerous sensors capable of achieving any of these forms of detection are widely known and available for this purpose.

Therefore, the visual scene(s) targeted by the apparatus/method of the present invention are constantly being viewed and temporarily stored. The triggering of the storage/preservation of desired visual scenes is accomplished by any manner of means thoroughly described in the original written description (physical forces/impact, audio-visual values exceeding predetermined norms, or even simple manual triggering of the storage/preservation of the desired images).

As a further example, although not specifically mentioned in the original written description, but instead omitted as clearly being well within the level of ordinary skill in the prior art, accelerometers utilizing piezo-electric crystals for detecting vibration energy/g-forces have been utilized in the prior art for several decades. Applicant respectfully submits that any ordinary mechanic or one of ordinary skill in the related art would appreciate that these devices could easily accomplish the clearly articulated objects of the present invention.

Applicant respectfully submits that since the present invention is directed toward a method and apparatus of detecting and recording incidents, Applicant's thorough description of the numerous ways of triggering detection and/or storage of incidents is adequate to enable one of ordinary skill in the art to make and/or use the present invention.

With respect to claim 22, Applicant respectfully submits that the term manual activation can be interpreted to mean either a device requiring "hand activation" or "human induced" action (e.g., The American Heritage Dictionary, Third Edition, defines "manual" as "2. Done by or operated with the hands. 3. Employing human rather than mechanical energy: *manual labor*").

Conclusion

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

Attached hereto is a marked-up version of the changes made to the application by this Amendment.

In the event there are any matters remaining in this application, the Examiner is invited to contact Matthew Shanley, Registration No. 47,074 at (703) 205-8000 in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made

MARKED-UP VERSION OF THE AMENDMENTS

IN THE SPECIFICATION (Using line numbers as printed in application)

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Between lines 6 and 7, please add/amend the following paragraphs as follows:

- -One of the ways of selectively preserving only valuable data is through the use of a manual trigger for the preservation of captured scenes. The manual triggering can be a triggering action selected from the group consisting of taking snap shots of a visual scene, taking a sequence of continuous images of said visual scene, and suspending and preventing an additional visual scene from being captured so that buffered scenes are preserved. [The triggering action is achieved through a the use of a touch screen having a sensor detecting a touching event, a voice activation system having a sound sensor detecting a voice event and/or a button switch for simulating a sensor event that is directly connected to a triggering circuitry].

The triggering of the preservation of buffered scenes can also be accomplished by any combination of software mechanisms, firmware mechanisms, and/or hardware mechanisms. The firmware or software mechanisms will have programmable logic instructions that fire off a signal in response to an external event. The hardware mechanisms comprise at least one sensor (i.e. sensor 50) capable of [sending out a signal upon] detecting a physical event, wherein said physical event can be any combination of a

physical impact, sudden changes in momentum, [force], acceleration or sound wave amplitude patterns, shock wave and manual activation.

In addition, sound waves are captured in synchronization with a captured visual scene, the captured sound waves are buffered using a first-in-first-out mechanism in the same manner as for a visual scene; and the then buffered sound waves can be preserved for a predetermined period of time before and after an incident as a result of a manual or automatically detected triggering/external event.- -

IN THE CLAIMS

Claims 10, 17 and 21 have been cancelled.

Claims 22-25 have been added.

Please amend the claims as follows:

1. (Twice Amended) A digital incident recording apparatus comprising:
means for continuously capturing an actual visual scene within the vicinity of said apparatus wherein said means for capturing said visual scene is achieved by an image capturing unit;

means for buffering up a plurality of captured visual scenes having a finite number of storage elements over-written repeatedly using a first-in-first-out mechanism such that a finite storage can be used to hold a plurality of said visual scenes continuously;

means for preserving buffered scenes long enough to be stored and viewed after an incident has occurred;

means for manually triggering a preservation of captured scenes, wherein said means for manually triggering can be a manual activation action, said manual activation action including taking a sequence of continuous images of said visual scene, wherein said preservation of said buffered scenes is achieved by prohibiting older said buffered scenes from being erased and replaced by new captured scenes after a preprogrammed elapsed time period such that said plurality of said visual scenes are comprised of a number of said captured scenes captured a number of seconds before and after said manual activation action.

[means for triggering a preservation of said buffered scenes, wherein said means for triggering is a mechanism chosen from the group consisting of software mechanisms, firmware mechanisms, and hardware mechanisms, wherein said firmware or software mechanisms comprise programmable logic instructions that fire off a signal in response to an external event, wherein said hardware mechanisms comprise at least one sensor capable of detecting a physical event, wherein said physical event is at least one of a physical impact, sudden change in momentum, sudden change in force, shock wave, sudden change in sound wave amplitude, and manual activation; and

means for providing overall operational control of said apparatus].

6. (Amended) A digital incident recording apparatus as recited in claim 2 wherein said means for buffering up said captured scenes is achieved by feeding said captured scenes into said volatile memory [unit] device.

7. (Twice Amended) A digital incident recording apparatus as recited in claim 1 further comprising:

an additional image capturing unit that captures scenes of side and back views [to include activities of an operator when said apparatus is to be used inside a transportation system].

8. (Amended) A digital incident recording apparatus as recited in claim 1, further [comprises] comprising:

an additional [said] image capturing unit that captures scenes of side and back views, wherein said additional image capturing unit has [its own] separate said means for buffering up said captured scenes and means for preserving said buffered scenes.

12. (Amended) A digital incident recording apparatus as recited in claim 1, further [comprises] comprising:

means for capturing sound [wave] waves in synchronization with [the] said captured visual scene;

means for buffering said captured sound [wave] waves using said first-in-first-out mechanism in the same manner as for said visual scene; and

means for preserving said buffered sound [wave] waves in the same manner as for said visual scene.

13. (Amended) A digital incident recording apparatus as recited in claim 11, further [comprises] comprising:

an installation means which allows said apparatus to be taken out of an installation base and to be used as a recording apparatus outside of a transportation system, wherein said installation means is selected from the group consisting of attaching said apparatus onto a surface and inserting said apparatus into a housing unit large enough to hold said apparatus.

14. (Amended) A digital incident recording apparatus as recited in claim 11, further [comprises] comprising:

an installation means which allows the said apparatus to be taken out of an installation base and to be used as a hand-held recording apparatus, wherein said installation means is selected from the group consisting of attaching said apparatus onto a surface and inserting said apparatus into a housing unit large enough to hold said apparatus.

15. (Amended) A digital incident recording apparatus as recited in claim 1, wherein said means for buffering and means for preserving are coordinated via [for overall operational control comprises of] a control unit chosen from the group consisting of a micro-processor, a micro-controller, a DSP, a PAL, an EPLD, a FPGA and a programmable logic circuit.

16. (Twice Amended) A method for digitally recording incidents using a finite storage for capturing unanticipated events, said method comprising the steps of:

continuously capturing an actual visual scene in real-time and converting said actual visual scene into digital form;

[controlling operation and timing of said capturing step;]

continuously buffering a plurality of captured images from said capturing step using a first-in-first-out mechanism [into a persistent storage means so that said captured images can be buffered and preserved]; and

manually triggering a permanent preservation of a plurality of frames of said buffered images; wherein said permanent preservation of a plurality of frames of visual scenes is achieved by prohibiting older said images from being erased and replaced by newer images such that said plurality of frames stored are composed of a number of images captured so many seconds before, during and after said triggering.

18. (Twice Amended) A method for digitally recording incidents as recited in claim 16 further comprising the step of:

detecting an external event so as to generate [said] an automatic triggering step, wherein said external event is chosen from the group consisting of physical impact, sudden change in momentum, [sudden change in force], shock wave, sudden change in sound wave amplitude, [manual activation,] an unusual occurrence of objects in said captured images [a presence of objects in said captured images atypical from a predetermined value], a distance between said objects in said captured images, and an atypical movement of said objects; wherein said automatic triggering step includes a permanent preservation of a plurality of frames of visual scenes achieved by prohibiting older images from being erased and replaced by newer images such that said plurality of frames stored are composed of a number of images captured so many seconds before, during and after said triggering. [,

wherein said manual activation is selected from the group consisting of a button activation, touch screen activation and voice activation].

19. (Twice Amended) A method for digitally recording incidents as recited in claim [16] 18 further comprising the steps of:

capturing rear and side view scenes [to include activities of an operator of a transportation system];

buffering said rear and side view scenes using said first-in-first-out mechanism to form a plurality of buffered images; and
preserving said buffered images when said triggering [step] steps occurs.

20. (Amended) A method for digitally recording incidents as recited in claim 16, further [comprises] comprising the [step] steps of:

capturing surrounding sound wave corresponding to said visual scene;
buffering said captured sound wave using said first-in-first-out mechanism in the same manner as for said visual scenes; and
preserving said buffered sound wave when said triggering occurs.